

WHAT IS CLAIMED:

subA2 1. A machine for producing a tissue web comprising:
a forming area including at least one rotating continuous dewatering wire with zonally varied wire permeability; and
at least one shoe press.

2. The machine in accordance with claim 1, further comprising a former including a forming element and two rotating continuous dewatering belts;

said two rotating continuous dewatering belts being arranged to converge to form a stock entry gap and being conducted over said forming element as an outer belt, which does not contact said forming element, and as an inner belt,

wherein at least one of said outer and said inner belts comprises said at least one rotating continuous dewatering wire with zonally varied wire permeability.

3. The machine in accordance with claim 2, wherein said forming element comprises a forming roll.

4. The machine in accordance with claim 3, wherein said shoe press comprises a separate unit arranged behind, in the belt travel direction, a unit including said forming element and said two dewatering belts.

5. The machine in accordance with claim 3, wherein the tissue web is carried by one of the two dewatering belts subsequent to said forming element, and the tissue web and said one dewatering belt is guided through said shoe press.

6. The machine in accordance with claim 2, wherein said former comprises a twin wire former.

subA3 7. The machine in accordance with claim 2, wherein said former comprises a crescent former, and wherein said outer belt comprises said at least one dewatering wire with zonally varied wire permeability and said inner belt comprises a felt belt.

8. The machine in accordance with claim 1, wherein said shoe press comprises a shoe press unit and an opposing element.

9. The machine in accordance with claim 8, wherein said opposing element comprises a drying cylinder.

10. The machine in accordance with claim 8, wherein said opposing element comprises a Yankee cylinder.

11. The machine in accordance with claim 1, wherein said shoe press has a press nip length, viewed in a belt travel direction, less than or equal to about 60 mm and has a pressure profile over said press nip length with a maximum pressing pressure greater than or equal to about 3.3 MPa.

12. The machine in accordance with claim 1, wherein said shoe press has a press nip length, viewed in a belt travel direction, greater than about 80 mm and has a pressure profile over said press nip length with a maximum pressing pressure less than or equal to about 2 MPa.

13. The machine in accordance with claim 12, wherein said press nip length is less than about 200 mm.

14. The machine in accordance with claim 12, wherein said press nip length is a maximum of about 150 mm.

15. The machine in accordance with claim 1, further comprising a drying zone in which the tissue web is acted upon at least partially by pressurized displacement gas.

sub A 16. The machine in accordance with claim 1, wherein said at least one dewatering wire with zonally varied wire permeability is located in an initial dewatering area.

17. The machine in accordance with claim 1, wherein said at least one dewatering wire with zonally varied wire permeability comprises a fabric formed by filling and warp yarns.

18. The machine in accordance with claim 17, wherein said at least one dewatering wire with zonally varied wire permeability comprises a fabric formed only

by filling and warp yarns.

19. The machine in accordance with claim 17, wherein zones of varied wire permeability of said at least one dewatering wire are produced by at least one of weaving yarns of varied diameter and varied weave pattern.

20. The machine in accordance with claim 1, further comprising a conditioning device assigned to said at least one dewatering wire with zonally varied wire permeability.

21. The machine in accordance with claim 20, wherein said conditioning device comprises a wire cleaning device.

~~22.~~ ^{bas} A process for producing a tissue web in a tissue machine having a forming area including at least one rotating continuous dewatering wire with zonally varied wire permeability and at least one shoe press, the process comprising:

dewatering the tissue web with at least the at least one continuous dewatering wire with zonally varied wire permeability; and

pressing the tissue web in the at least one shoe press.

23. The process in accordance with claim 22, wherein the tissue machine further including a former with a forming element and two rotating continuous dewatering belts arranged to converge to form a stock entry gap and then guided over the forming element as an outer belt, which does not contact the forming element, and as an inner belt, such that at least one of said outer and said inner belts comprises said at least one rotating continuous dewatering wire with zonally varied wire permeability, and said process further comprises:

forming the tissue web between the inner and outer belts; and

guiding the inner and outer belts and tissue web over the forming element.

24. The process in accordance with claim 23, wherein the forming element comprises a forming roll, and said process further comprises:

guiding the inner and outer belts and the tissue web over the forming roll.

25. The process in accordance with claim 23, wherein the shoe press is arranged as a separate from, and behind in a belt travel direction, a unit including the forming element and the two dewatering belts.

26. The process in accordance with claim 23, further comprising:
carrying, after the forming element and on one of the two dewatering belts, the tissue web; and

guiding the tissue web and the one dewatering belt through the shoe press.

27. The process in accordance with claim 23, wherein said former comprises a twin wire former.

3bA6 28. ~~The process in accordance with claim 23, wherein said former comprises a crescent former, and the outer belt comprises the at least one dewatering wire with zonally varied wire permeability, and the inner belt comprises a felt belt.~~

29. The process in accordance with claim 22, further comprising:
dewatering at a machine speed greater than about 1300 m/min.

30. The process in accordance with claim 22, further comprising:
dewatering at a machine speed greater than about 1500 m/min.

31. The process in accordance with claim 22, further comprising:
dewatering at a machine speed greater than about 1800 m/min.

3bA7 32. ~~The process in accordance with claim 22, further comprising dewatering the tissue web, in an initial dewatering area, with at least the at least one dewatering wire with zonally varied wire permeability.~~

33. The process in accordance with claim 22, wherein the at least one dewatering wire with zonally varied wire permeability comprises a fabric formed by filling and warp yarns.

34. The process in accordance with claim 33, wherein the at least one dewatering wire with zonally varied wire permeability comprises a fabric formed only by filling and warp yarns.

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35. The process in accordance with claim 22, wherein the at least one dewatering wire with zonally varied wire permeability comprises zones of varied wire permeability formed by at least one of weaving yarns of varied diameter and varied weave pattern.

36. The process in accordance with claim 22, wherein the at least one dewatering wire with zonally varied wire permeability is located in an area in which solids content of the tissue web is less than about 20%.

37. The process in accordance with claim 36, wherein the at least one dewatering wire with zonally varied wire permeability is located in an area in which solids content of the tissue web is less than about 12%.

38. The process in accordance with claim 36, wherein the at least one dewatering wire with zonally varied wire permeability is located in an initial sheet forming area having a solids content of less than about 6%.

39. An tissue paper former comprising:

a forming element;

at least two rotating continuous dewatering wires, in which at least one of said two rotating continuous dewatering wires has a zonally varied wire permeability, arranged over said forming element, as an outer wire not in contact with said forming element and as an inner wire; and

at least one shoe press arranged downstream, relative to a wire travel direction, from said forming element.

40. The tissue paper former in accordance with claim 39, wherein said forming element comprises a forming roll.

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41. The tissue paper former in accordance with claim 40, wherein the at least one dewatering wire with zonally varied wire permeability comprises a plurality of zones, each zone having a maximum extension of less than about 5 mm.

42. The tissue paper former in accordance with claim 41, wherein said

maximum extension of each said zone is less than about 3 mm.

6A9 43. The tissue paper former in accordance with claim 40, wherein said former comprises a ~~crescent former~~, and wherein said outer belt comprises said at least one dewatering wire with zonally varied wire permeability and said inner belt comprises a felt belt.

44. The tissue paper former in accordance with claim 43, further comprising a suction zone located within a loop of said inner belt; and
a conditioning device associated with said outer belt.

45. The tissue paper former in accordance with claim 44, wherein said suction zone is located in said forming roll.

46. The tissue paper former in accordance with claim 45, further comprising an apparatus to one of control or regulate said suction zone.

47. The tissue paper former in accordance with claim 45, wherein said suction zone comprises at least two suction zones separated in a belt run direction.

48. The tissue paper former in accordance with claim 47, further comprising an apparatus to one of control or regulate said at least two suction zones.

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